

MOORE TOWNSHIP (Corunna)

water pollution control plant

1968

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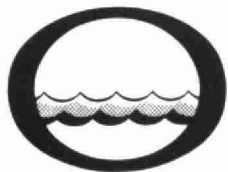
Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 7
Ontario

We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.


D. S. Caverly,
General Manager.


D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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MOORE TOWNSHIP (CORUNNA)
water pollution control plant

operated for

THE TOWNSHIP OF MOORE

by the

ONTARIO WATER RESOURCES COMMISSION

1968 ANNUAL OPERATING SUMMARY

MOE
WPC.P
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FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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'67 REVIEW

The total operating cost for 1968 was \$16,554.63, a large increase in the cost per million gallons treated over 1967. The 1968 costs were higher than the 1967 costs mostly due to a large increase in salaries. The cost per pound of BOD removed was 21 cents, a reduction from the 24 cents of 1967.

In general, operation of the plant was similar to that of previous years. The relatively low flows and loading have continued to make use of more than one half of the plant unnecessary. The spare aeration tank was used to store storm water flows.

The average daily flow to the plant was 109,000 gallons per day representing 34 percent of the total design capacity and 68 percent of the capacity of the portion of the plant in use. There was a flow decrease of six percent from the 1967 total. It is obvious from the high flows approaching design flow rates that occur during periods of heavy rain, that there are still numerous storm water connections to the sewers.

The raw sewage average strengths of 213 mg/l BOD and 248 mg/l suspended solids were much higher than the 1966 averages. Average reductions of 95 percent BOD and 93 percent suspended solids were achieved. An average of 2.7 cubic feet of grit was removed per million gallons of sewage.

The annual inspection of the sewer system during the early fall months did not disclose any problems.

The Corunna plant is operated by Mr. S. Bechard. Supervision of the plant is based on a total of 40 hours per week, made up of 36 hours from Monday to Friday inclusive, and two hours each on Saturday and Sunday. A part-time assistant is used for weekend relief, holidays, sickness, attendance at training courses, or when additional assistant is required for inspecting and cleaning sewers.

During the past year, Mr. Bechard attended the Chief Operators' Conference held in Toronto.

PROJECT COSTS

NET CAPITAL COST (Estimated)	\$762,379.92
DEDUCT - Portion Financed by CMHC-MDLB (Estimated)	<u>300,550.70</u>
Long Term Debt to OWRC	<u>\$461,829.22</u>
 Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	 \$ <u>53,366.70</u>
 Net Operating	\$ 16,554.63
Debt Retirement	9,320.00
Reserve	4,084.58
Interest Charged	<u>25,919.12</u>
 TOTAL	 \$ <u>55,878.33</u>

RESERVE ACCOUNT

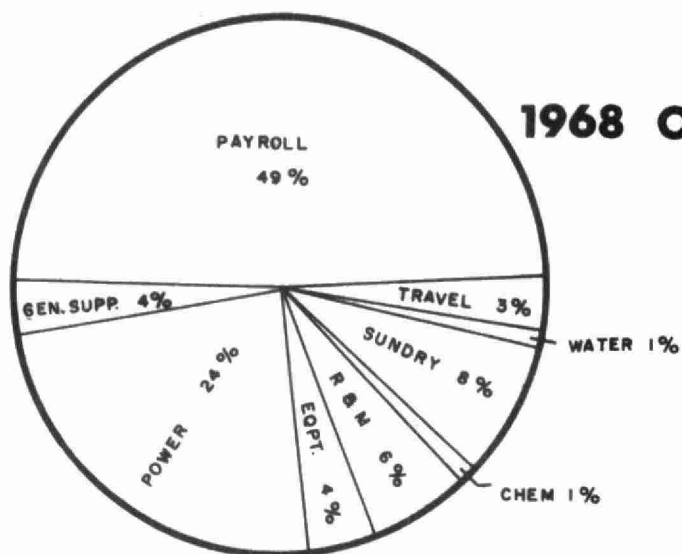
Balance at January 1, 1968	\$ 19,416.66
Deposited by Municipality	4,081.58
Interest Earned	1,141.73
	\$ 24,642.97
 Less Expenditures	 <u>6,043.45</u>
Balance at December 31, 1968	\$ <u>18,599.52</u>

Monthly Operating Costs

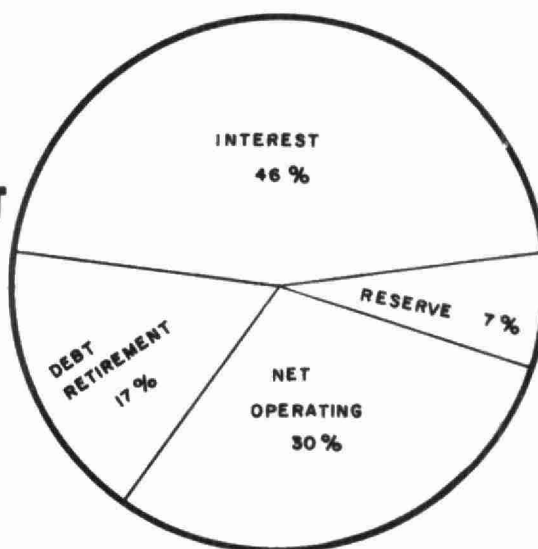
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	877.33	478.19	6.00	-	346.88	19.95	10.50	-	-	15.81	-	-
FEB	883.95	478.19	-	-	318.88	-	58.37	-	15.54	12.97	-	-
MAR	1246.70	768.39	12.00	-	358.33	-	9.77	-	-	98.21	-	-
APRIL	1242.95	478.19	6.00	-	291.88	-	38.55	314.36	-	86.59	27.38	-
MAY	1184.82	478.19	18.00	-	368.98	108.29	58.25	-	-	153.11	-	-
JUNE	1038.79	478.19	165.90	-	327.68	-	52.05	-	-	14.97	-	-
JULY	1280.07	467.98	273.12	-	339.83	-	65.62	-	-	52.66	27.38	53.48
AUG	1361.38	722.39	318.40	-	-	-	8.40	-	237.40	74.79	-	-
SEPT	1819.73	484.80	210.91	-	637.71	-	86.14	-	270.43	129.74	-	-
OCT	1562.88	481.29	68.45	-	330.88	113.80	100.12	400.00	(40.00)	14.44	93.90	-
NOV	1653.31	471.05	24.00	-	334.29	-	53.68	-	139.95	526.34	-	104.00
DEC	2402.72	1248.77	20.00	-	258.38	-	89.08	-	371.91	157.84	-	256.74
TOTAL	16554.63	7035.62	1122.78	-	3913.72	242.04	630.53	714.36	995.23	1337.47	148.66	414.22

*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$665.10

BRACKETS INDICATE CREDIT



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	32.02	\$10,546.67	\$329.38	17 cents
1965	32.62	12,595.65	386.11	21 cents
1966	31.10	11,851.63	381.06	24 cents
1967	42.49	14,853.48	349.61	24 cents
1968	39.94	16,554.63	414.49	21 cents

Process Data

FLOW

During 1968, a total of 39.94 million gallons was treated at the plant. This represents an average daily flow of 109,000 gallons. The maximum day flow received was 205,000 gallons in March. The maximum flow for one month was 3.87 million or 125,000 gallons per day and occurred in March.

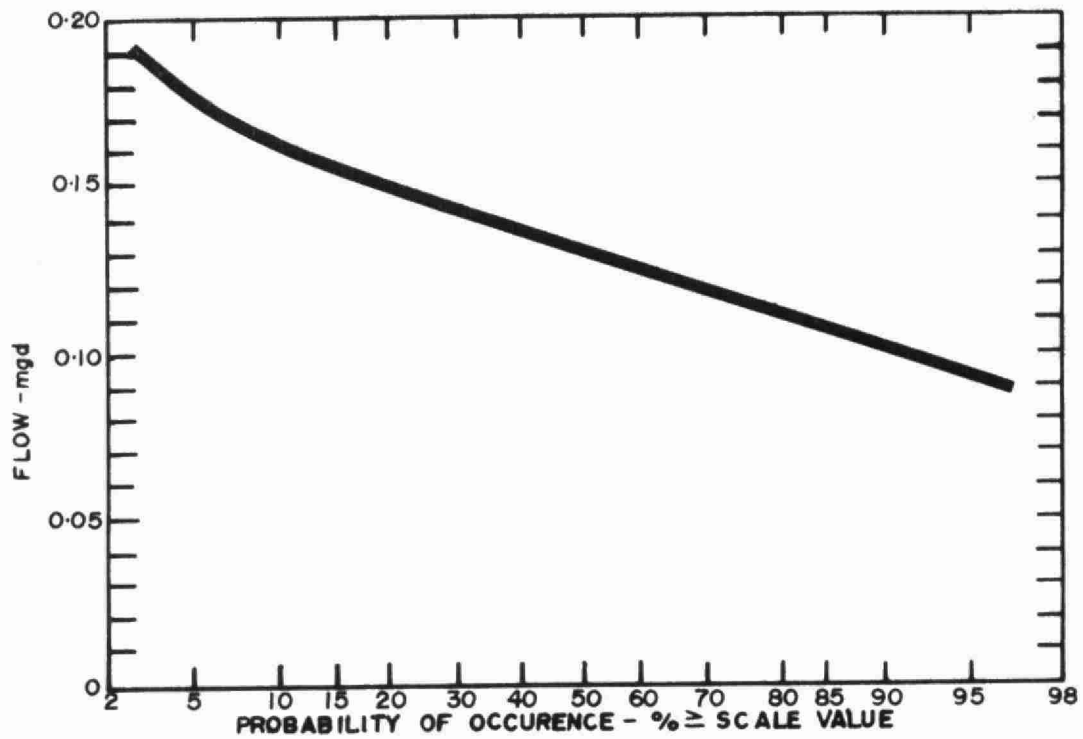
Based on the March readings, the plant operated at 39% of design capacity. On the basis of the year's average flow the plant operated at 34% of design capacity. The total flow for the year was 6% lower than in 1966.

CHLORINATION

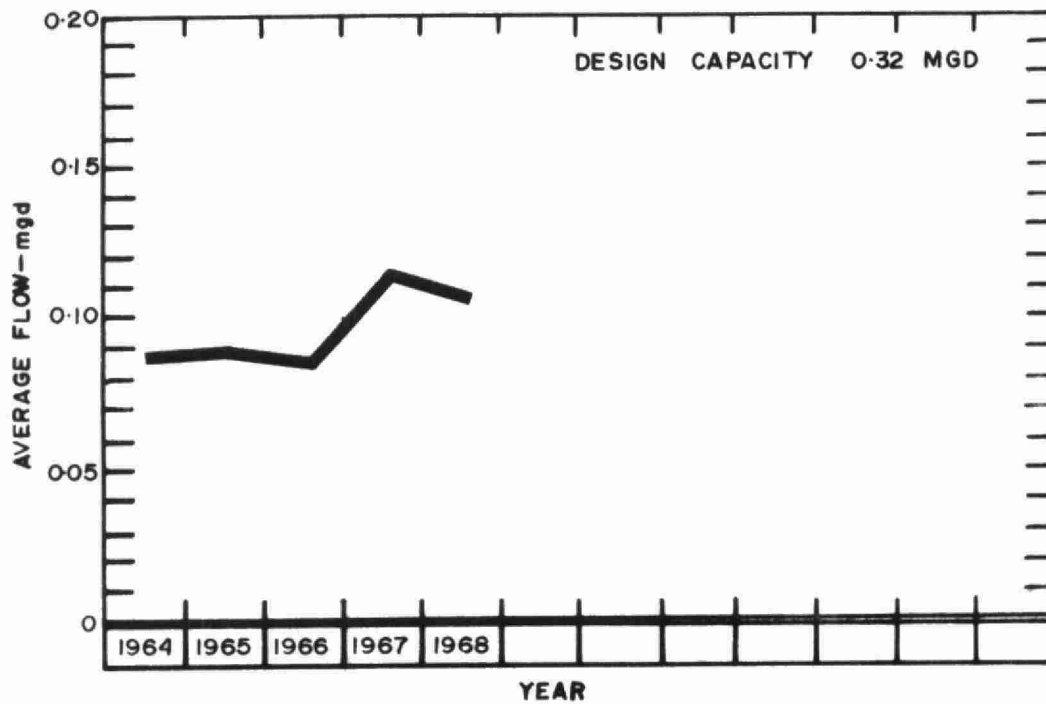
Chlorination of the final effluent is carried out every month. An average of 153 pounds of chlorine per month was required (an average dosage rate of 4.60 mg/l) to maintain a residual of at least 0.5 mg/l. A check on the 15-minute residual is impossible at this plant, since the plant was constructed without a chlorine contact chamber. The end of the outfall is not accessible for sampling.

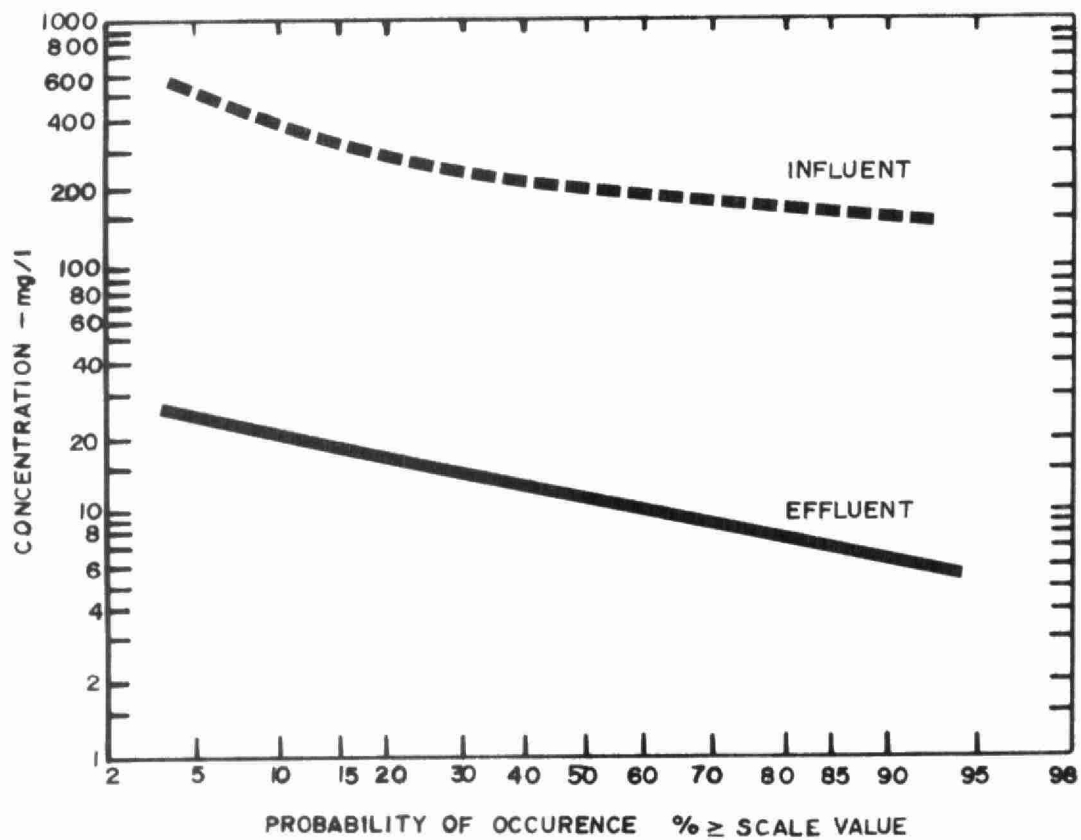
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED lbs.	DOSAGE mg/l
JAN	3.68	.119	.148	.100	155	4.2
FEB	3.61	.125	.201	.105	145	4.0
MAR	3.87	.125	.205	.102	155	4.0
APR	3.62	.121	.182	.096	150	4.1
MAY	2.88	.092	.185	.060	155	5.4
JUN	2.47	.082	.169	.059	150	6.1
JUL	2.27	.073	.155	.039	155	6.8
AUG	3.77	.122	.176	.099	155	4.1
SEPT	3.65	.122	.180	.097	150	4.1
OCT	3.24	.105	.122	.089	155	4.8
NOV	3.35	.112	.191	.092	150	4.5
DEC	3.53	.114	.159	.090	155	4.4
TOTAL	39.94	-	-	-	1830	-
AVERAGE	-	.109	-	-	153	4.6

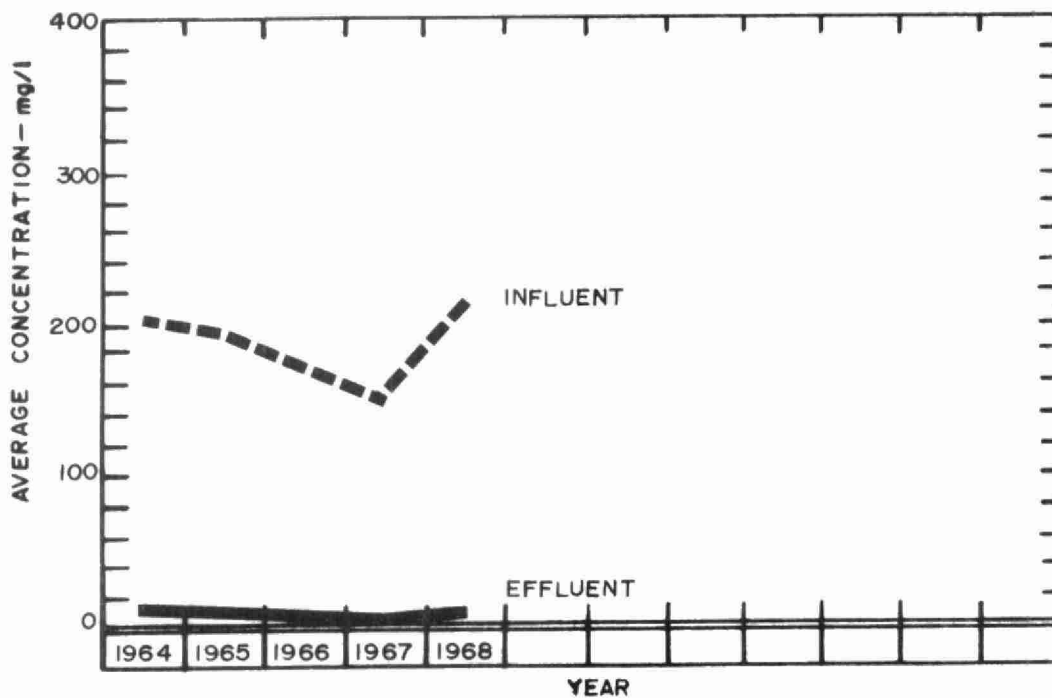


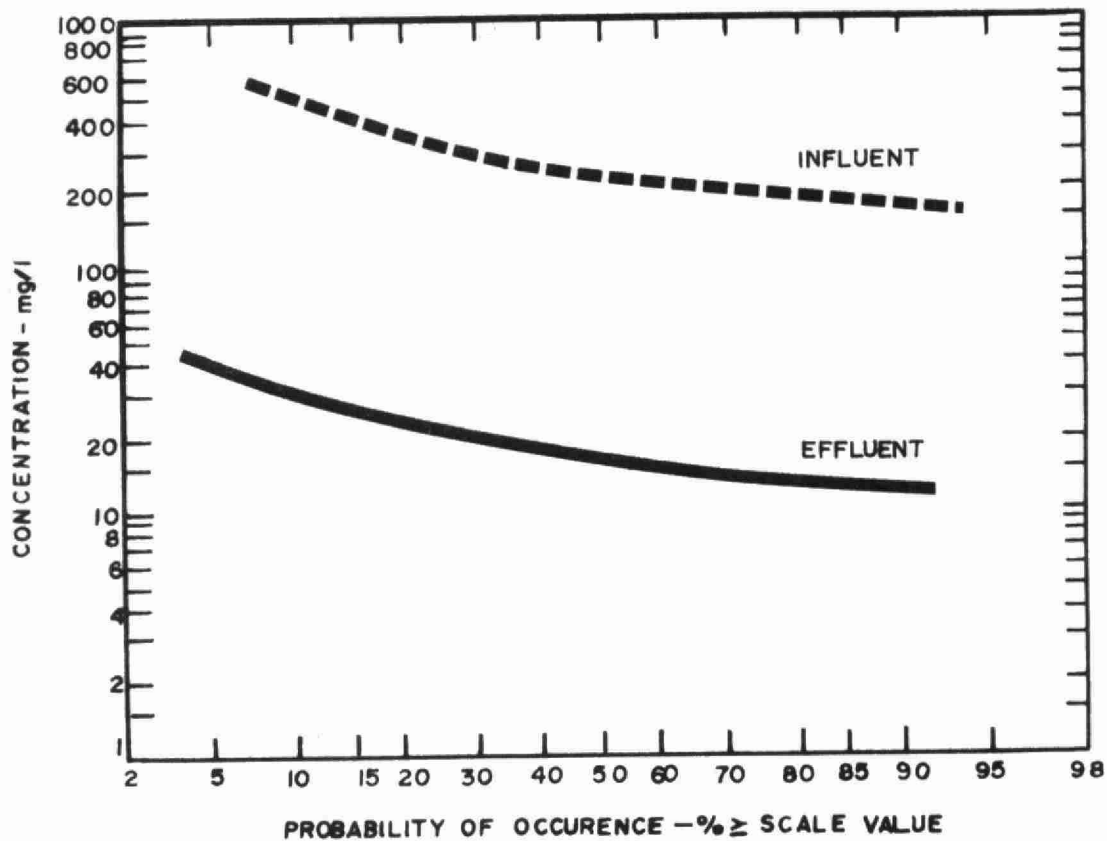
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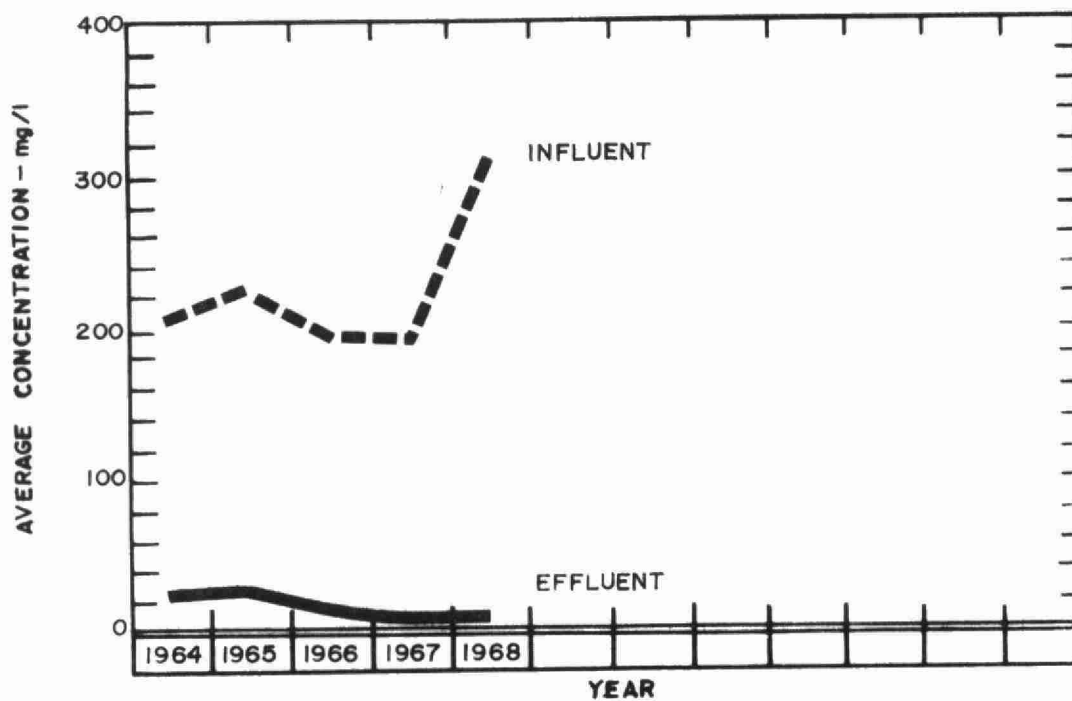


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC ^N mg/l	EFF CONC ^N mg/l	RED ^N %	REMOVAL 10 ³ lb	INF CONC ^N mg/l	EFF CONC ^N mg/l	RED ^N %	REMOVAL 10 ³ lb	REMOVAL ft ³
JAN	92	6	93	3.1	232	12	95	8.1	9
FEB	218	11	95	7.5	232	24	90	7.5	9
MAR	192	6	97	7.2	208	13	94	7.5	8
APR	261	11	96	9.1	281	17	94	9.6	9
MAY	200	22	89	5.1	256	45	82	6.1	9
JUN	195	15	92	4.4	273	23	92	6.2	8
JULY	173	8	95	3.7	187	11	94	4.0	9
AUG	220	5	98	8.1	158	9	94	5.6	14
SEPT	196	14	93	6.6	192	9	95	6.7	8
OCT	279	12	96	8.7	340	10	97	10.7	8
NOV	224	11	95	7.1	269	17	93	8.4	7
DEC	300	10	97	10.2	353	8	98	12.1	9
TOTAL	-	-	-	80.8	-	-	-	92.5	107
AVERAGE	213	11	95	6.7	248	17	93	7.7	9

COMMENTS

There was a substantial increase in the 1968 BOD and suspended solids concentrations over the 1967 values of 154 and 195 mg/l respectively. This increase is reflected in slightly higher BOD and suspended solids concentrations in the effluent. However, the percentage removal remained essentially the same. This resulted in an increase of 31% in lbs. of BOD removed and 18% in lbs. of suspended solids removed.

The grit removal has decreased by six cubic feet per month from the 1967 value, and is four cubic feet per month lower than in 1966.

SLUDGE DISPOSAL

Month	Sludge to Holding Tank (10 ⁴ Gals.)	Sludge Disposal (10 ⁴ Gals.)
January	8.70	0
February	2.80	0
March	11.10	1.20
April	9.50	0.60
May	4.30	0.0
June	4.10	0.58
July	5.70	1.20
August	2.60	0
September	8.00	1.20
October	4.10	.88
November	2.60	.67
December	5.90	.67
TOTAL	69.40	7.00
AVERAGE	5.78	.58

COMMENTS

A total of 694,000 gallons of waste sludge was pumped to the holding tank, where it was reduced to 70,000 gallons by aeration and decantation.

This resulted in an average of 8700 gallons per month of sludge being hauled away by tank truck for disposal on farmland.

AERATION

MONTH	AVERAGE FLOW mgd	INFLUENT		SECONDARY EFF		MLSS CONC ^N mg/l	F/M ($\frac{\text{lb BOD}}{\text{lb MLSS}}$)	AIR USED ($\frac{1000 \text{ ft}^3}{\text{lb BOD}}$) REMOVED	WASTE SLUDGE lb
		BOD CONC ^N mg/l	SS CONC ^N mg/l	BOD CONC ^N mg/l	SS CONC ^N mg/l				
JAN	0.119	92	232	6	12	15,800	.004	14.10	-
FEB	0.125	218	232	11	24	11,600	.01	5.58	-
MAR	0.125	240	208	6	13	10,200	.01	6.20	-
APRIL	0.121	316	281	11	17	7,500	.03	4.75	-
MAY	0.092	200	256	22	45	5,600	.02	8.78	-
JUN	0.082	195	273	15	23	4,200	.02	9.73	-
JUL	0.073	173	187	8	11	5,700	.01	12.00	-
AUG	0.122	220	158	5	9	7,500	.02	5.50	-
SEPT	0.122	196	192	14	9	8,500	.01	6.49	-
OCT	0.105	279	340	12	10	8,500	.03	5.12	-
NOV	0.112	224	268	11	17	8,400	.02	6.03	-
DEC	0.114	300	353	10	8	6,600	.03	4.35	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.109	213	248	11	17	8,350	.02	7.39	-

COMMENTS

In 1968, the MLSS were adjusted through a wide range of values in an attempt to improve the treatment results at the plant. It should be noted in a comparison of the effluent BOD and solids with the MLSS concentration, that best results are obtained when the MLSS is kept high.

Again in 1968, a reduction was achieved in the amount of air required per pound of BOD removed. This 18% reduction was primarily due to a substantial increase in the BOD loading on the plant rather than a reduction in the air pumped to the aeration section.

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CONCLUSIONS

During the past year, a high efficiency of treatment was maintained in spite of an increasing BOD load. Waste sludge disposal continued to be effected by tank truck.

The structures, equipment and grounds were well maintained during the year, and no serious breakdowns were encountered. A storage and workshop building was constructed on the site during the summer.

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